

PATENT CLAIMS

1. Thermoplastic elastomer composition comprising at least one thermoplastic material (A) and at least one microgel (B) which is based on homopolymers or random copolymers and is not crosslinked by high-energy radiation.
2. Thermoplastic elastomer composition according to claim 1, characterized in that the primary particles of the microgel (B) have an approximately spherical geometry.
3. Thermoplastic elastomer composition according to claim 1 or 2, characterized in that the deviation of the diameters of an individual primary particle of the microgel (B), defined as
$$[(d1 - d2) / d2] \times 100,$$
wherein d1 and d2 are any two desired diameters of any desired section of the primary particle and d1 is > d2, is less than 250 %.
4. Thermoplastic elastomer composition according to claim 3, wherein the said deviation is less than 50 %.
5. Thermoplastic elastomer composition according to one of claims 1 to 3, characterized in that the primary particles of the microgel (B) have an average particle size of 5 to 500 nm.
6. Thermoplastic elastomer composition according to one of claims 1 to 5, characterized in that the primary particles of the microgel (B) have an average particle size of less than 99 nm.

7. Thermoplastic elastomer composition according to one of claims 1 to 6, characterized in that the microgels (B) have contents which are insoluble in toluene at 23 °C of at least about 70 wt.%.
- 5 8. Thermoplastic elastomer composition according to one of claims 1 to 7, characterized in that the microgels (B) have a swelling index in toluene at 23 °C of less than about 80.
- 10 9. Thermoplastic elastomer composition according to one of claims 1 to 8, characterized in that the microgels (B) have glass transition temperatures of -100 °C to +50 °C.
- 15 10. Thermoplastic elastomer composition according to one of claims 1 to 9, characterized in that the microgels (B) have a width of the glass transition range of greater than about 5 °C.
- 20 11. Thermoplastic elastomer composition according to one of claims 1 to 10, characterized in that the microgels (B) are obtainable by emulsion polymerization.
- 25 12. Thermoplastic elastomer composition according to one of claims 1 to 11, characterized in that the thermoplastic materials (A) have a Vicat softening temperature of at least 50 °C.
- 30 13. Thermoplastic elastomer composition according to one of claims 1 to 12, characterized in that the thermoplastic material (A) is chosen from thermoplastic polymers (A1) and thermoplastic elastomers (A2).
14. Thermoplastic elastomer composition according to one of claims 1 to 13, characterized in that the difference in glass transition

temperature between the thermoplastic material (A) and the microgel (B) is between 0 and 250 °C.

- 5 15. Thermoplastic elastomer composition according to one of claims 1 to 14, characterized in that the weight ratio of thermoplastic material (A) / microgel (B) is from 1 : 99 to 99 : 1.
- 10 16. Thermoplastic elastomer composition according to one of claims 1 to 15, characterized in that the weight ratio of thermoplastic material (A) / microgel (B) is from 10 : 90 to 90 : 10, particularly preferably 20 : 80 to 80 : 20.
- 15 17. Thermoplastic elastomer composition according to one of claims 1 to 16, characterized in that it additionally comprises at least one conventional plastics additive.
- 20 18. Thermoplastic elastomer composition according to one of claims 1 to 17, characterized in that it is obtainable by mixing at least one thermoplastic material (A) and at least one microgel (B) which is based on homopolymers or random copolymers and is not crosslinked by high-energy radiation.
- 25 19. Thermoplastic elastomer composition according to one of claims 1 to 18, characterized in that the microgel (B) has functional groups.
- 30 20. Use of microgels (B) which are based on homopolymers or random copolymers and are not crosslinked by high-energy radiation for the preparation of thermoplastic elastomer compositions.
21. Process for the preparation of thermoplastic elastomer compositions according to one of claims 1 to 19 by mixing at least

one thermoplastic material (A) and at least one microgel (B) which is based on homopolymers or random copolymers and is not crosslinked by high-energy radiation.

- 5 22. Process for the preparation of thermoplastic elastomer compositions according to claim 21, characterized in that the preparation of the microgel (B) is carried out before the mixing with the thermoplastic material (A).
- 10 23. Thermoplastic elastomer compositions obtainable by the process according to claim 21 or 22.
- 15 24. Use of the thermoplastic elastomer compositions according to one of claims 1 to 19 as a masterbatch for incorporation into thermoplastic materials.
- 20 25. Use of the thermoplastic elastomer compositions according to one of claims 1 to 19 for the production of thermoplastically processable shaped articles.
26. Shaped articles obtainable by shaping the thermoplastic elastomer compositions according to one of claims 1 to 19.